

Amendment to the Claims:

1. (Canceled)

2. (Currently amended) The imaging system as set forth in ~~claim 1~~ claim 8, wherein the time-varying electrical parameter is selected from a group consisting of:

- a time-varying complex impedance,
- a time-varying resistance,
- a time-varying capacitance,
- time-varying inductance,
- a time varying current, and
- a time varying voltage.

3. (Currently amended) The imaging system as set forth in ~~claim 1~~ claim 8, wherein the diagnostic imaging scanner is a computed tomography scanner.

4. (Currently amended) The imaging system as set forth in ~~claim 1~~ claim 8, wherein the electrical meter includes:

- a voltage pulse generator that applies a voltage pulse train to the electrode pair; and
- an ammeter that measures an electrical current flowing between the electrode pair responsive to the applied voltage pulse train.

5. (Currently amended) The imaging system as set forth in ~~claim 1~~ claim 8, further including:

- an imaging controller that receives the respiration characteristic and controls the diagnostic imaging scanner based thereon.

6. (Currently amended) The A diagnostic imaging system as set forth in ~~claim 1~~, wherein including:

a diagnostic imaging scanner that acquires imaging data of a subject in an examination region;

a reconstruction processor that reconstructs the acquired imaging data into an image representation;

a pair of electrodes adapted to externally contact a thoracic region of the subject;

an electrical meter that measures a time-varying electrical parameter across the electrode pair by applying a voltage or current pulse train having a frequency substantially higher than the heart rate across the pair of electrodes; and

a monitor that extracts a time-varying respiration characteristic from the measured time-varying electrical parameter, the monitor includes: including a differentiator that computes a time derivative of the time-varying electrical parameter.

7. (Previously presented) The imaging system as set forth in claim 6, wherein the time-varying electrical parameter includes a time-varying resistance, the differentiator computes a first derivative, and the monitor further includes:

a respiration state processor that computes the respiration parameter as one of:

inhaling corresponding to a positive time derivative of the time varying resistance,

exhaling corresponding to a negative time derivative of the time varying resistance, and

a breath-hold state corresponding to a substantially zero time derivative of the time-varying resistance.

8. (Currently amended) ~~The~~ A diagnostic imaging system as set forth in claim 1, ~~wherein~~ including:

a diagnostic imaging scanner that acquires imaging data of a subject in an examination region;

a reconstruction processor that reconstructs the acquired imaging data into an image representation;

a pair of electrodes adapted to externally contact a thoracic region of the subject;

an electrical meter that measures a time-varying electrical parameter across the electrode pair by applying a voltage or current pulse train having a frequency substantially higher than the heart rate across the pair of electrodes; and

a monitor that extracts a time-varying respiration characteristic from the measured time-varying electrical parameter, the monitor includes: including a respiratory cycle phase processor that estimates a respiratory cycle phase based on the time varying electrical parameter.

9. (Currently amended) The imaging system as set forth in ~~claim 1~~ claim 8, wherein the monitor includes:

a calibration that correlates electrical parameter values with a tidal volume of air in lungs of the subject; and

a transform processor that references the calibration to transform the time varying electrical parameter into a time-varying tidal volume of air in the lungs.

10. (Currently amended) The imaging system as set forth in ~~claim 1~~ claim 8, further including:

an image data binning means for sorting imaging data into respiratory cycle phase bins based on the time-varying respiration characteristic, the reconstruction processor reconstructing data in a selected one or more of the respiratory cycle phase bins.

11. (Currently amended) The A diagnostic imaging system as ~~set forth in claim 1,~~ further including:

a diagnostic imaging scanner that acquires imaging data of a subject in an examination region;

a reconstruction processor that reconstructs the acquired imaging data into an image representation;

a pair of electrodes adapted to externally contact a thoracic region of the subject;

an electrical meter that measures a time-varying electrical parameter across the electrode pair by applying a voltage or current pulse train having a frequency substantially higher than the heart rate across the pair of electrodes;

a monitor that extracts a time-varying respiration characteristic from the measured time-varying electrical parameter; and

an electrocardiograph that measures electrocardiographic data of the subject using at least the pair of electrodes.

12-14. (Canceled)

15. (Currently amended) The method as set forth in ~~claim 13~~ claim 26, wherein the contacting of the thoracic region with the electrodes pair includes:

relatively arranging the electrodes pair with a substantial portion of the thoracic region disposed therebetween.

16. (Currently amended) The method as set forth in ~~claim 13~~ claim 26, wherein the acquiring of imaging data includes:

passing x-rays through an imaging region;

measuring x-ray intensities after passing through the imaging region;

and

computing x-ray absorption data from the measured x-ray intensities.

17-18. (Canceled)

19. (Currently amended) The method as set forth in ~~claim 13~~ claim 26, further including:

measuring ~~cardiac-cycling~~ electrocardiographic data using the external pair of electrodes.

20. (Currently amended) The method as set forth in ~~claim 13~~ claim 26, wherein the measuring of ~~cardiac-cycling~~ electrocardiographic data using

the pair of electrodes is performed substantially simultaneously with the measuring of a time-varying electrical parameter across the electrodes pair.

21. (Currently amended) The method as set forth in ~~claim—13~~ claim 26, wherein the measuring of a time-varying electrical parameter across the electrodes pair includes:

measuring a time-varying resistance across the electrodes pair.

22. (Currently amended) The method as set forth in ~~claim—13~~ claim 26, wherein the computing of a time-varying ~~respiration characteristic from respiratory cycle phase function based on~~ the time-varying electrical parameter includes:

determining a respiration state based on a temporal slope of the time-varying electrical parameter.

23. (Currently amended) The method as set forth in ~~claim—13~~ claim 26, wherein the computing of a time-varying ~~respiration characteristic from respiratory cycle phase function based on~~ the time-varying electrical parameter includes:

selecting a respiration state based on a temporal slope of the time-varying electrical parameter, the respiration state being selected as one of:

inhaling corresponding to a positive temporal slope,
exhaling corresponding to a negative temporal slope, and
a breath-hold state corresponding to a generally horizontal slope.

24. (Currently amended) The method as set forth in ~~claim—13~~ claim 26, wherein the computing of a time-varying respiration characteristic from the time-varying electrical parameter further includes:

computing a respiration rate proportional to a temporal frequency of the time varying electrical parameter.

25. (Currently amended) The method as set forth in ~~claim 13~~ claim 26, wherein the computing of a time-varying respiration characteristic from the time-varying electrical parameter further includes:

computing a time-varying tidal volume function of air in lungs of the patient based on the time varying electrical parameter.

26. (Currently amended) The A medical diagnostic imaging method as set forth in claim 13; including:

acquiring imaging data of a medical imaging patient;

reconstructing at least a part of the acquired imaging data into an image representation;

externally contacting a thoracic region of the patient with the pair of external electrodes;

measuring a time-varying electrical parameter across the external electrodes pair during the acquiring of imaging data, the measuring including applying one of a voltage and a current to the external electrodes pair, measuring the other of voltage and current responsive to the applying, and computing the time-varying electrical parameter based on the applied and measured quantities; and

computing a time-varying respiration characteristic based on the measured time-varying electrical parameter wherein the computing of a time-varying respiration characteristic from the time-varying electrical parameter includes~~[[:]]~~ computing a time varying respiratory cycle phase function based on the time varying electrical parameter.

27. (Currently amended) The method as set forth in ~~claim 13~~ claim 26, further including:

gating the acquiring of imaging data based on the extracted ~~time-varying respiration characteristic~~ time varying respiratory cycle phase function.

28. (Canceled)

29. (Currently amended) The method as set forth in ~~claim—13~~
claim 26, wherein the applying one of a voltage and a current to the external
electrodes pair comprises:

applying a pulse train of voltage or current pulses having a pulse
frequency substantially higher than the heart rate to the electrodes pair.

30. (Currently amended) The imaging system as set forth in ~~claim—1~~
claim 8, wherein the electrical meter applies the voltage or current pulse train having
a frequency in the tens of kilohertz range.